

# PATENT SPECIFICATION (11)

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## (54) CHAIN LINK

(71) We, MANSIGN ENGINEERING LTD a British Company of Brookfield Works, Eagle Close, Rolleston Drive, Arnold, Nottingham, NG5 3HJ do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:-

The present invention relates to a chain link for use in a cable supporting chain.

Cable supporting chains are used for supporting power cables between a moving machine and a stationary power source.

According to the present invention there is provided a chain link for a cable support chain, the chain link including a pair of side members laterally spaced from one another and secured together by a connecting member the side members being adapted for pivotal connection with side members of similar links, the chain link in cross-section having upper and lower U-shaped channels defined by said side members and connecting member for receiving cables, each side member having an upper wall and a bottom wall each of which is directed toward the other side member, the upper walls being co-planar and spaced from one another to define a mouth for the upper channel, and the bottom walls being co-planar and spaced from one another to define a mouth for the lower channel. Preferably, a first closure means is provided to restrict the mouth of the upper channel and second closure means is provided to restrict the mouth of the lower channel.

Reference is now made to the accompanying drawings, in which:

Figure 1 is a side view of a first embodiment according to the present invention;

Figure 2 is a plan view of the first embodiment;

Figure 3 is an end view of the first embodiment;

Figure 4 is an end view similar to Figure 3 of a second embodiment according to the present invention;

Figure 5 is a side view of a third embodiment according to the present invention;

Figure 6 is an end view, partially in section, of the third embodiment;

Figure 7 is a sectional plan view of the third embodiment taken along line VII-VII in Figure 6.

Referring initially to Figures 1 to 3 there is shown a first embodiment according to the present invention in the form of a chain link 10 for use in a cable carrying chain.

The link 10 includes a pair of side members 12, 14 each of which is identical in shape and includes a side wall 15 from which projects a top wall 17 and a bottom wall 18. Each side wall 15 has longitudinal projections 20, 21 respectively projecting in opposite longitudinal directions. Projection 20 is provided with a circular aperture 24 and projection 21 has an elongate slot 25 having a width equal to the diameter of aperture 24.

Projection 21 is co-planar with the central portion of the side wall and projection 20 is contained in a plane which is off-set from and parallel to the plane containing the remainder of the side portion. Each side wall 15 is conveniently stamped from a sheet of steel and bent into shape.

The side walls 15 are arranged so that the lateral spacing between the outer faces of projections 20 is less the lateral spacing between the inner faces of projections 21 and are connected to one another by connecting means 27 in the form of a connecting plate 28 which is secured at opposite ends, by welding, to each side member 12, 14 and is located approximately mid-way between the top and bottom walls of each side member.

As seen in Figure 3, the top walls and bottom walls of both side members 12, 14 are co-planar to define upper and lower slide surfaces for the chain link 10.

The connecting means 27, in cross-section, divide the link 10 into two generally U-shaped channels 30, and 31 for receiving power cables 40. Channel 30 in cross-section is defined by connecting plate 28, the upper portions of side members 12, 14 and the top walls 17 of both side members 12, 14; the top walls 17 being spaced from one another to define a mouth 32 of channel 30. Closure means 42, in the form of a bolt 44 threadedly received in a boss 45 secured to connecting plate 28, projects upwardly from plate 28 to restrict the mouth 32 and thereby restrain removal of cables through mouth 32.

Similarly, channel 31 is defined in cross-section by the connecting plate 28, the lower portions of side members 12, 14 and bottom

walls 18; the bottom walls 18 being spaced from one another to define a mouth 46 of channel 31. Closure means 48 in the form of a bolt 49 threadedly received in a boss 50 secured to connecting plate 28, projects downwardly from plate 28 to restrict the mouth 46 and thereby restrain removal of cables through mouth 46.

In use, chain links 10 are pivotally secured end to end by fitting the projections 20 of one link between the projections 21 of an adjacent link aligning the slots of projections 20 with the apertures of projections 21. A headed rivet 70 (see Figure 7) having a shank diameter equal to the diameter of aperture 24 is passed through the slot 25 of one projection 21 which is aligned with the aperture 24 of the adjacent projection 20 and securing a circlip to the end of the rivet to prevent its removal. Thus each link is pivotally connected to its neighbour by two coaxially aligned headed rivets. The provision of the slots 25 enable neighbouring links to hinge about an axis perpendicular to their pivotal connection and thus a length of chain is capable of snaking.

The lateral spacing between side members 12, 14 may be varied as desired during construction to accommodate varying sizes of supply cable. Thus, in Figure 4 a second embodiment is illustrated wherein similar parts have been designated with similar reference numbers. In this embodiment, the connecting plate 28 has been made shorter so as to provide a chain link which is of reduced width.

In Figures 5 to 7 a third embodiment is illustrated, similar parts being designated by similar reference numerals.

The chain link 80 illustrated Figures 5 to 7 is constructed so that the side members 12, 14 may be separated from one another. Accordingly, the connecting means 27 is in the form of a connecting member 82 which is secured to side member 12 and projects laterally therefrom. The member 82 shown is of square cross-section and the terminal end portion 83 of the connecting member is of reduced dimension to define a shoulder 84. The end portion 83 projects through a square shaped aperture 86 inside member 14 to receive a removable pin 85 which, when in position, prevents removal of side member 14 from end portion 83.

In order to prevent snagging, the aperture 86 is located in a depression 89 formed in side wall 14, the depth of the depression being greater than the amount by which end portion 83 projects from aperture 86. The connecting member 82 is conveniently secured to side member 12 by projecting through a square shaped aperture 90 formed in side member 12 and being welded into position. The aperture 90 is located at the bottom of a depression 92 formed in side member 12, the depth of depression 92 being greater than the amount by which connecting member 82 projects from the aperture 90.

Due to the cross-sectional shape of connect-

ing member 82 and receiving aperture 86 the side members are restrained from rotating relative to one another about the axis of the connecting member 82. It will be appreciated however that the connecting member and aperture 86 need not necessarily be square shaped in cross-section but may be of other polygonal cross-sections.

It is envisaged that the connecting means 27 may be constructed so as to be adjustable in length, thereby enabling the width of a chain link to be varied as desired. For example, each side member may be provided with a lateral projection, the lateral projections being telescopically interconnected and locking means provided to secure the lateral projections in a desired telescopically adjusted position.

It is to be noted that the controller considers that the invention described in this specification cannot be performed without substantial risk of infringement of our U.K. Patent No 1502283.

#### WHAT WE CLAIM IS:

1. A chain link for a cable support chain, the chain link including a pair of side members laterally spaced from one another and secured together by a connecting member, the side members being adapted for pivotal connection with side members of similar links, the chain link in cross-section having upper and lower U-shaped channels defined by said side members and connecting member for receiving cables, each side member having an upper wall and a bottom wall each of which is directed toward the other side member, the upper walls being coplanar and spaced from one another to define a mouth for the upper channel, and the bottom walls being co-planar and spaced from one another to define a mouth for the lower channel.

2. A chain link according to Claim 1 wherein a first closure means is provided to restrict the mouth of the upper channel and second closure means is provided to restrict the mouth of the lower channel.

3. A chain link according to Claim 1 or 2 wherein each side member is stamped and formed from steel sheeting.

4. A chain link according to Claim 1 or 3 wherein the longitudinal end portions of the top walls are bent downwardly towards the bottom walls, and the longitudinal end portions of the bottom walls are bent upwardly toward the top walls.

5. A chain link according to any of Claims 1 to 4 wherein each side member includes longitudinally extending projections which are directed in opposite directions, the projections having apertures for reception of a pivot pin.

6. A chain link according to Claim 5 wherein for each side member the aperture in one projection is circular and the aperture in the other projection is an elongate slot extending longitudinally of the side member.

7. A chain link according to Claim 6

wherein the projection having the circular aperture is located in a plane parallel to and off-set from the plane containing the remainder of the side member.

5 8. A chain link according to any preceding Claim wherein the connecting member is a plate which is fixedly secured at opposite ends to each side member.

10 9. A chain link according to Claim 1 wherein the connecting member is releasibly secured to at least one of the side members to enable the side members to be separated from one another.

10. A chain link according to Claim 1 wherein the connecting member is adjustable in

length so as to enable the width of the chain link to be adjusted. 15

11. A chain link substantially as described with reference to and as illustrated in any of the accompanying drawings.

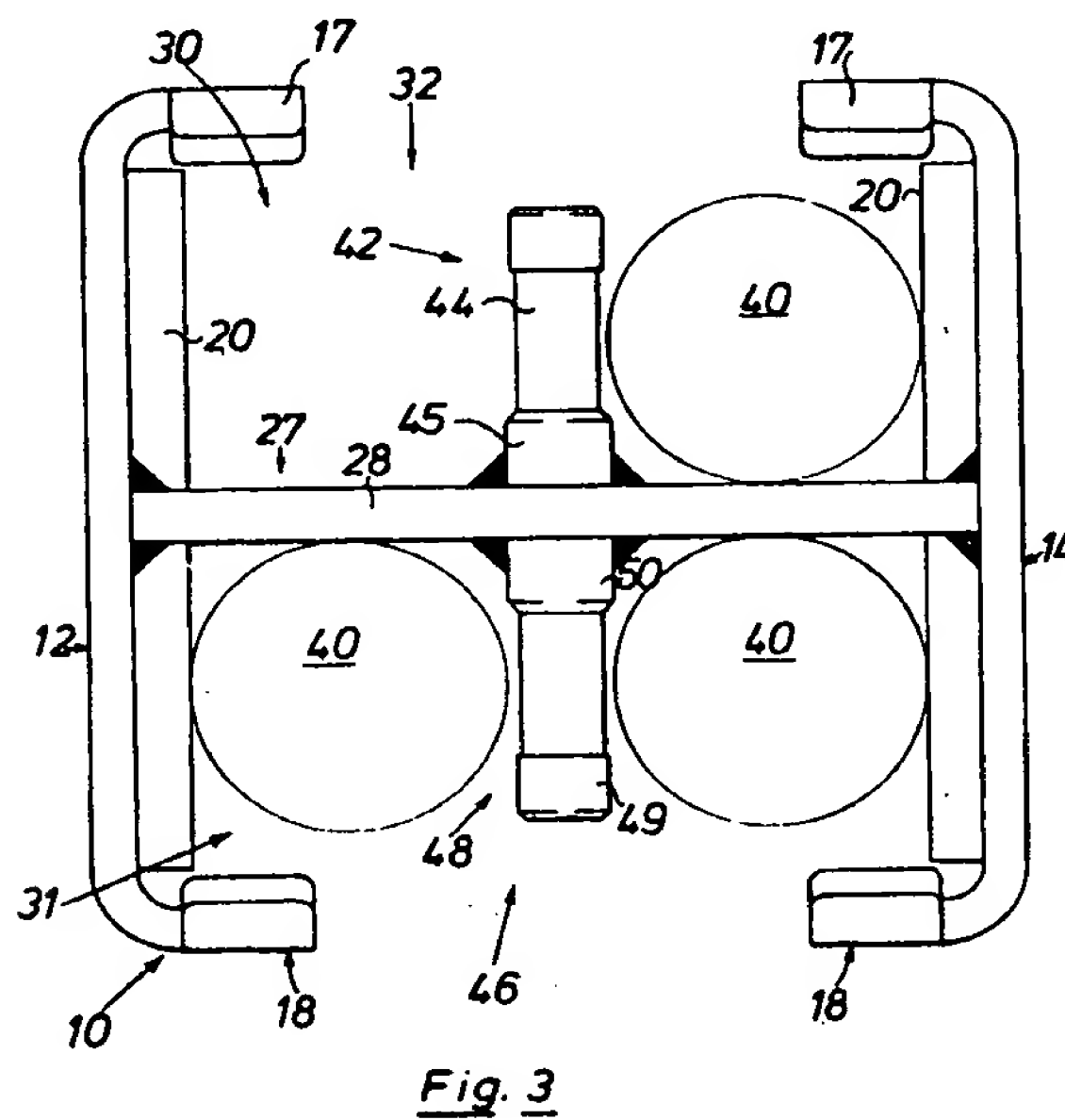
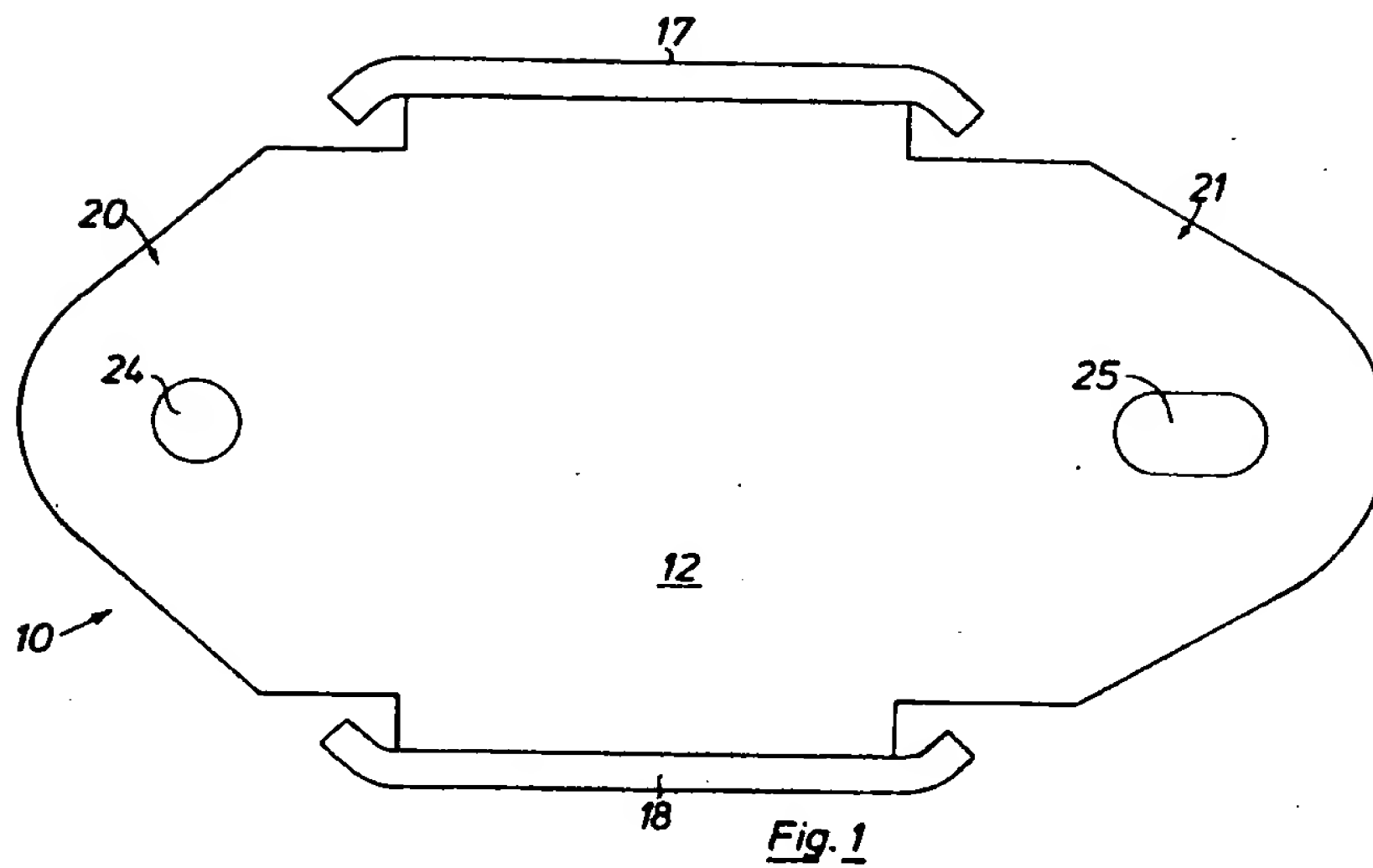
12. A cable support chain including a plurality of chain links according to any of Claims 1 to 10. 20

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## COMPLETE SPECIFICATION

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**Sheet 1**

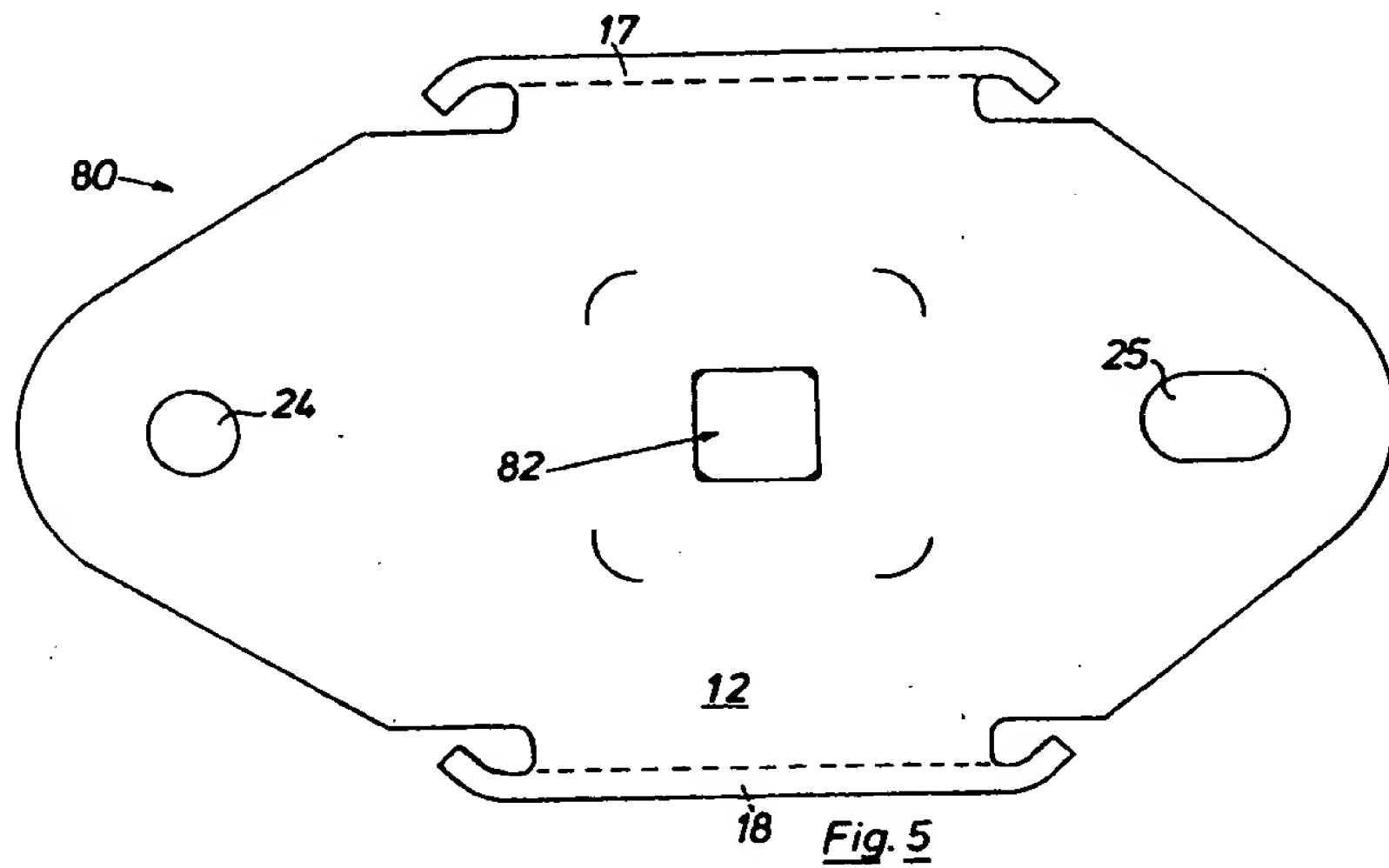
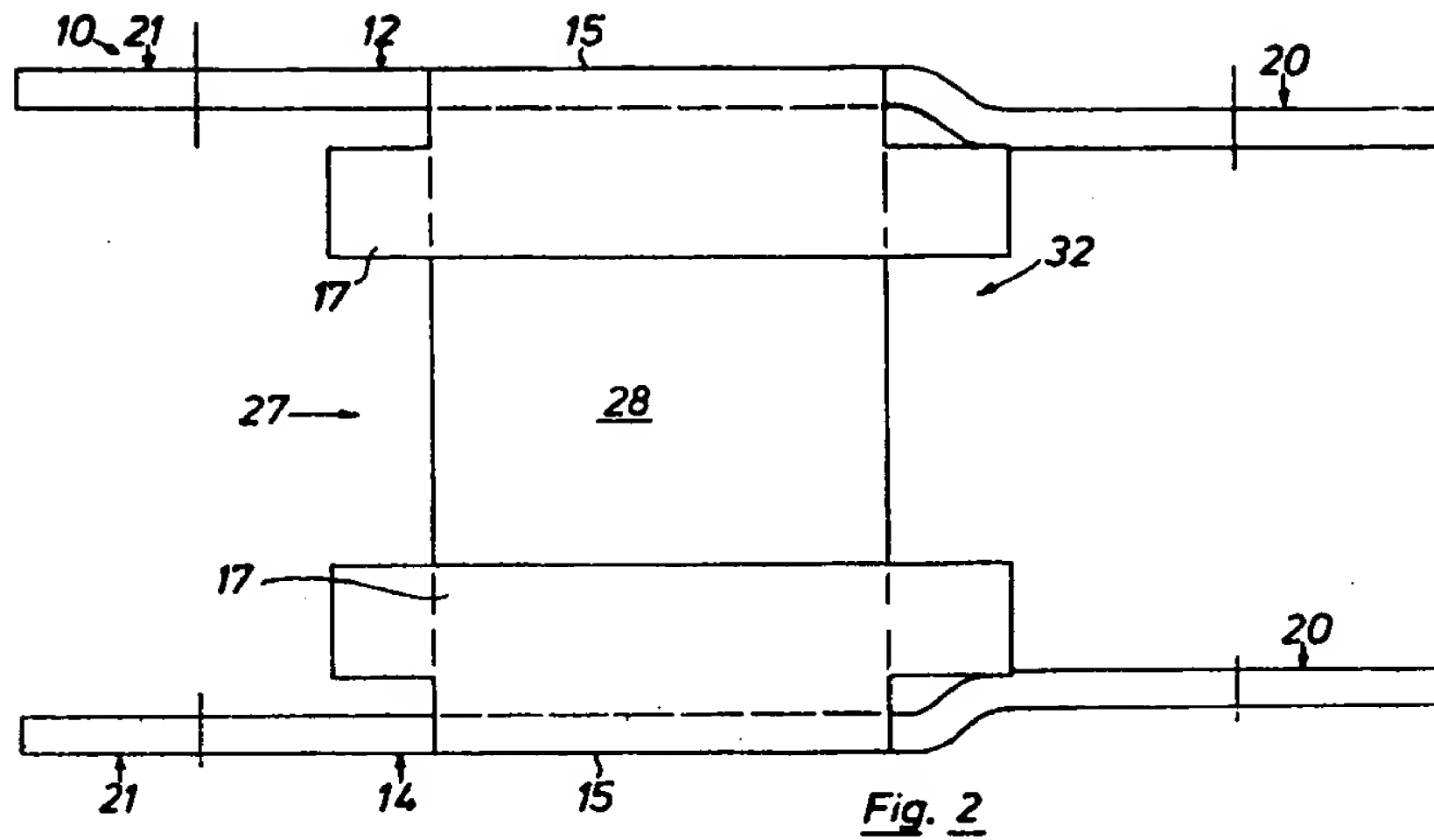


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COMPLETE SPECIFICATION

3 SHEETS

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Sheet 2



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COMPLETE SPECIFICATION

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Sheet 3

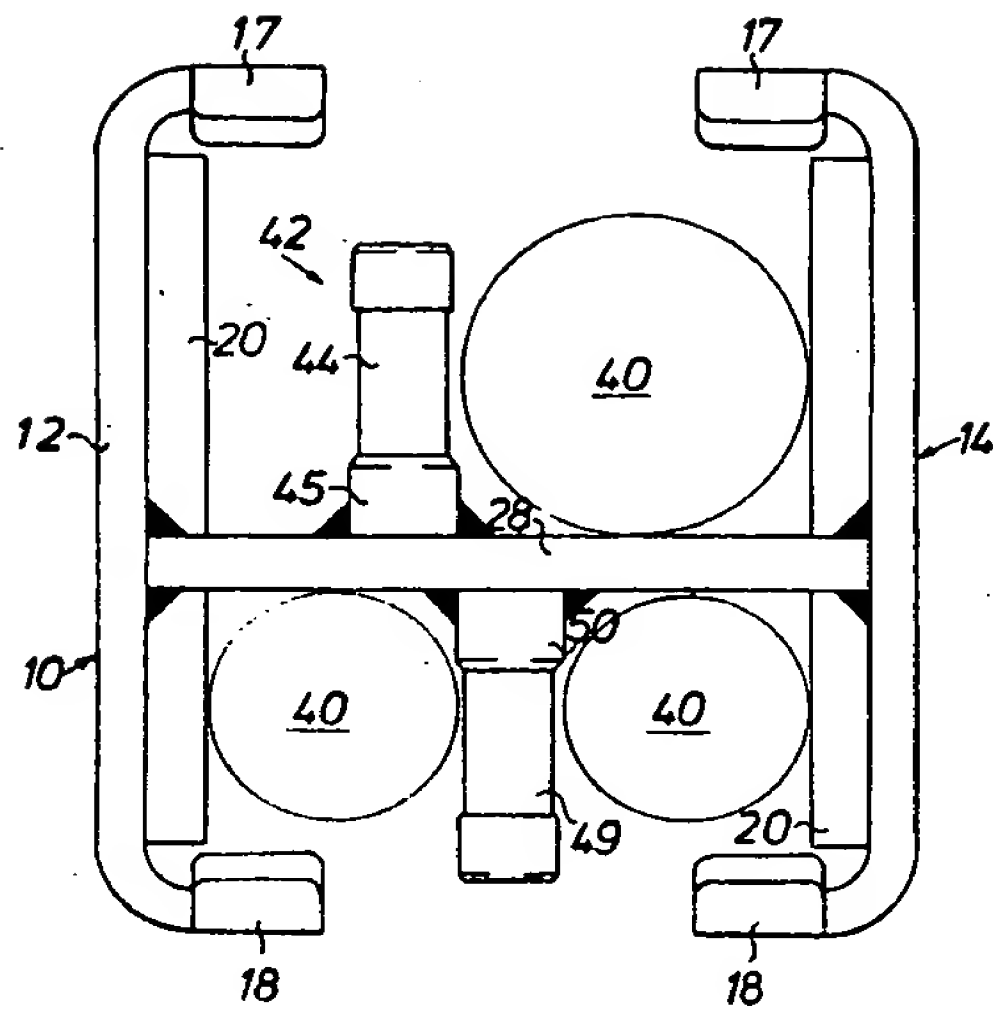


Fig. 4

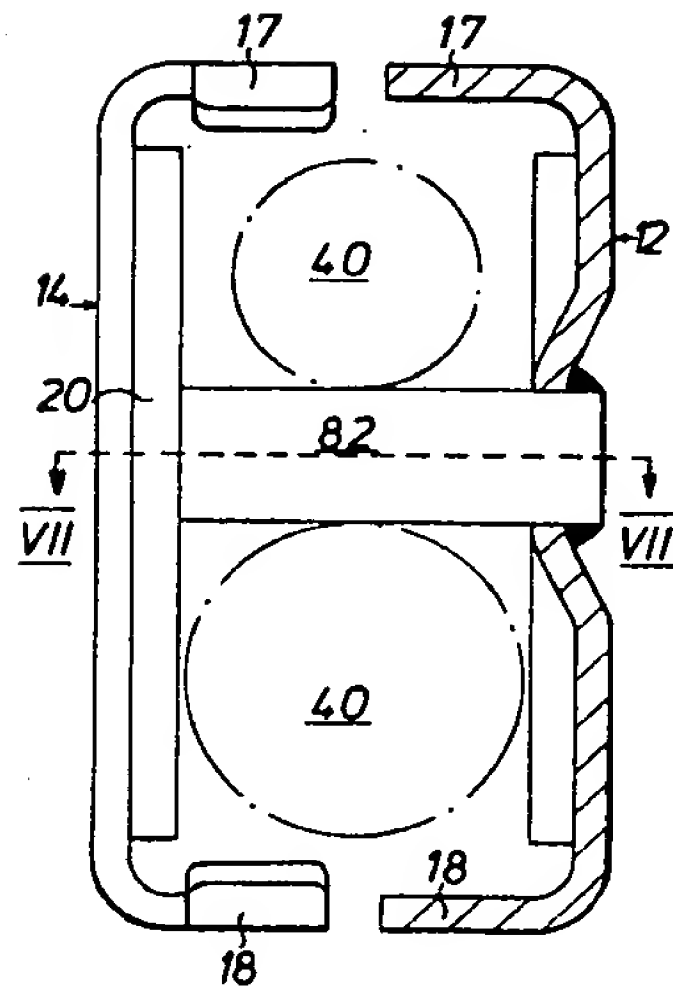


Fig. 6

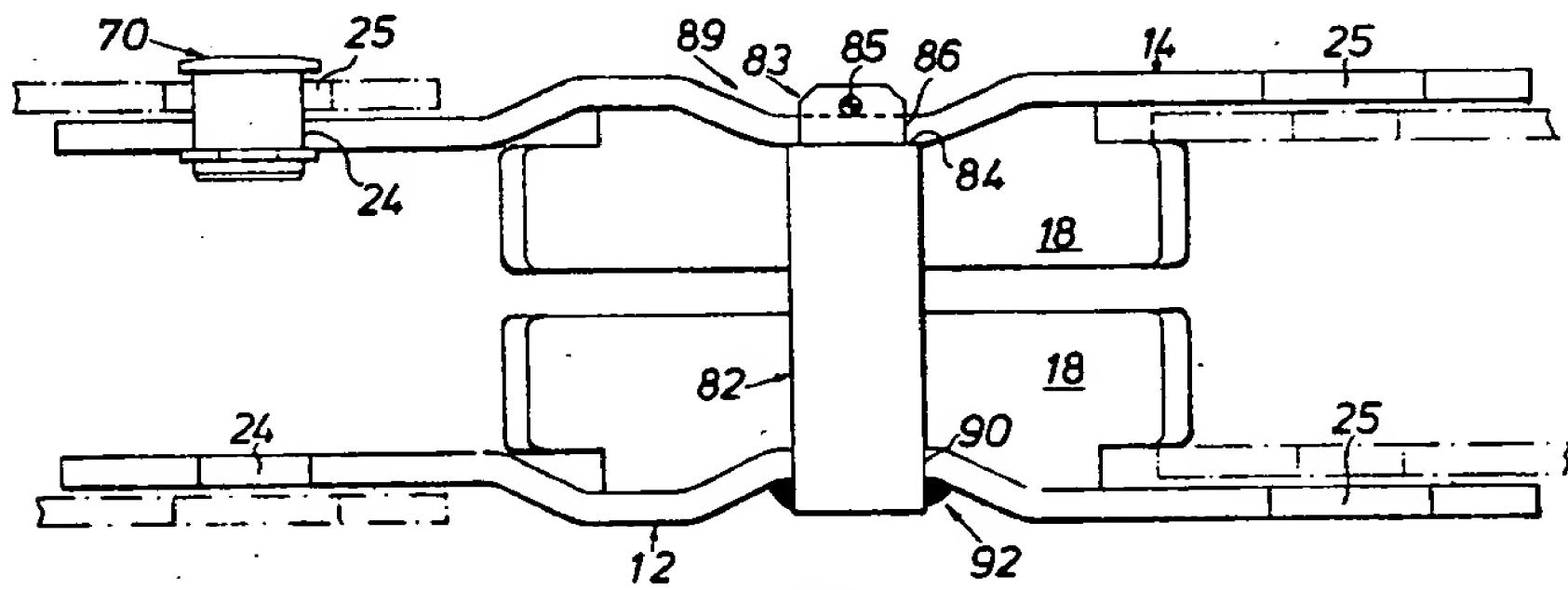


Fig. 7